Research article:
Bacillus subtilis response to mercury toxicity: A defense mediated by sulphur-rich molecules and oxidative prevention systems

Authors:

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Response to reviewers comments

We want to thank you for taking the time to review this manuscript. Please find the detailed responses below and the corresponding revisions/corrections highlighted/in track changes in the re-submitted files.

Point-by-point response to comments and suggestions for authors:

Reviewer 2

Reviewer: Some improvements that are recommended are:

Comment 1: It will be helpful to the reader to provide the results as a graph that supports the table 2 that has been provided.
Response 1: Thank you for the suggestion. We agree and therefore we present the data in Table 2 as a graph in Figure 1. This change can be found in *page 6 line 194* (highlighted in yellow) of the revised manuscript.
We also insert the appropriate changes in text of the revised manuscript as follows:
"(Figure 1)" *instead of* "(Table 2)" (*page 5 lines 189, 192 and page 6, line 196 in the figure legend)*

Comment 2: It would be helpful to provide a rationale on why it is important to study the effects of mercury in *Bacillus subtilis.*
Response 2: In order to attend this suggestion we provide additional information (*Page 2, lines 77-82)* as follow:

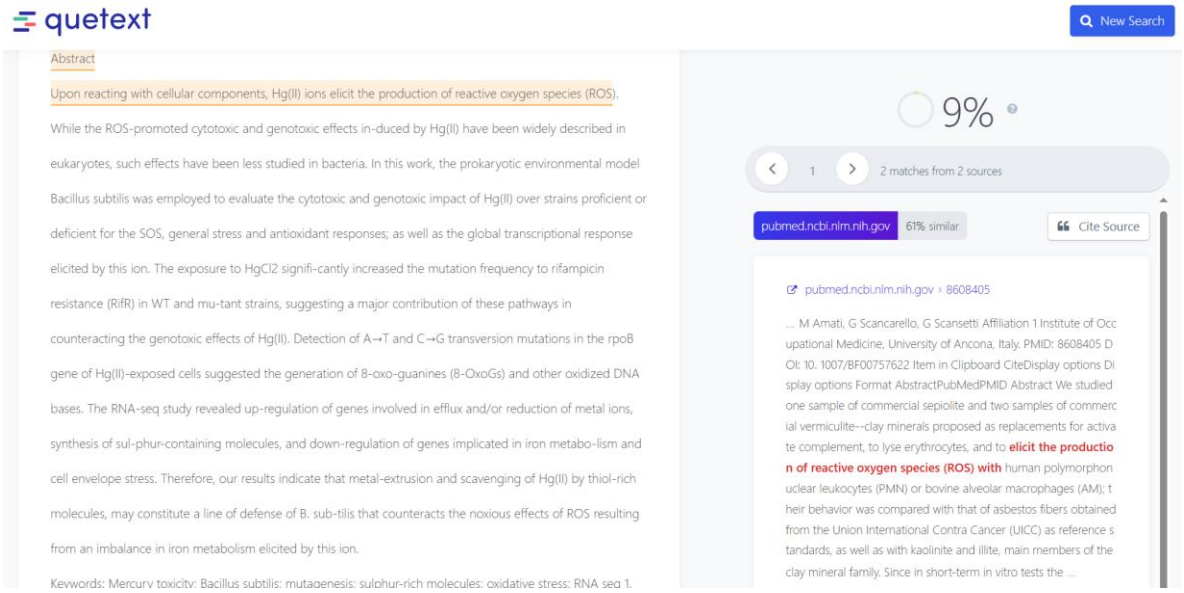
"The evolution has equipped *B. subtilis* with an arsenal of adaptive responses to monitor and rapidly respond to adverse growing conditions, including, nutrient limitation, sudden temperature changes, and exposure to distinct biologically toxic compounds. In contrast to *E. coli*, *B. subtilis* can proliferate in a wide diversity of habitats making this bacterium an ideal model of study to unravel the cellular strategies deployed by bacteria to survive challenging environmental conditions [20–24]."

Instead of:

"The Gram-positive bacterium *B. subtilis* has been successfully employed as an excellent model of cell differentiation as well as to unravel the mechanisms underlying the cell responses elicited by distinct environmental stressors [20–24]."

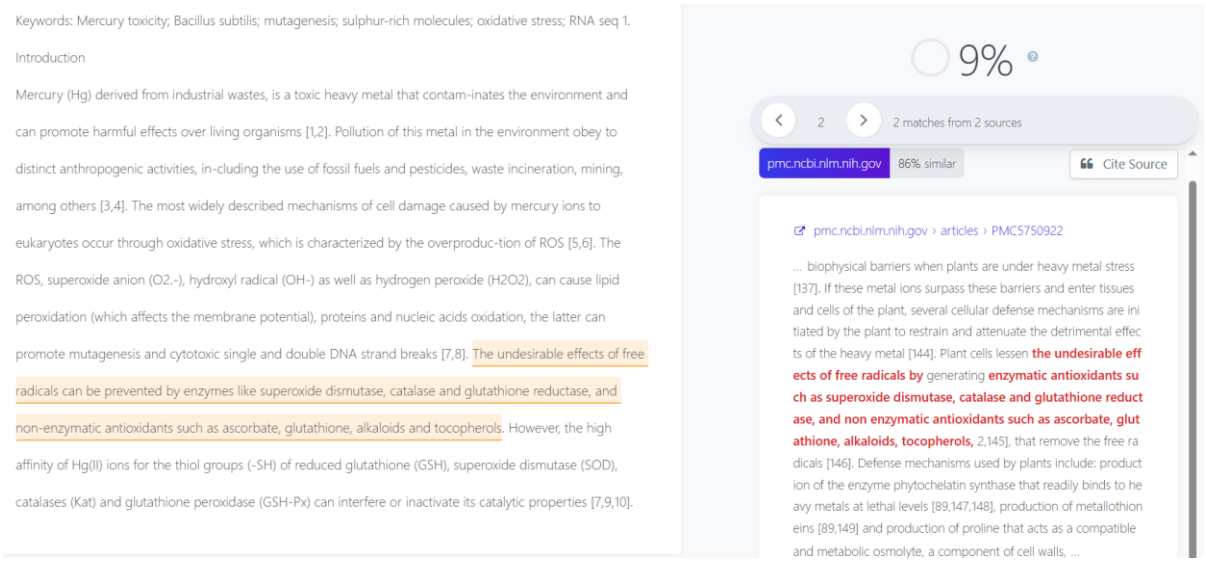
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Report of Abstract section

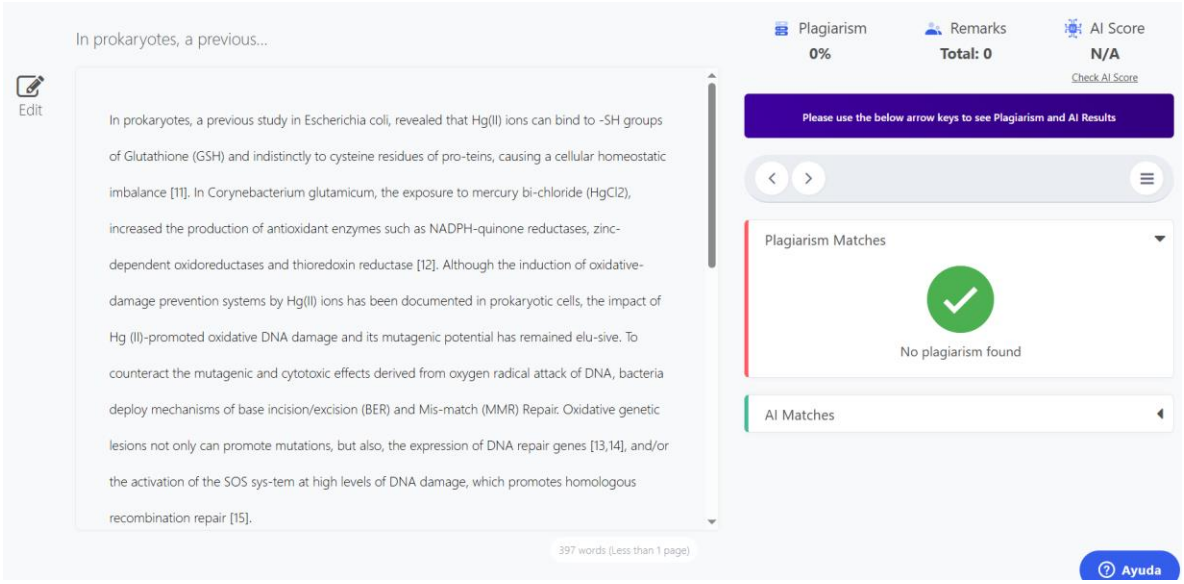


Report of First part of the Introduction section

A 9% was detected, however, identified plagiarism correspond to information that is appropriately cited (in the revised manuscript corresponds to reference 7).

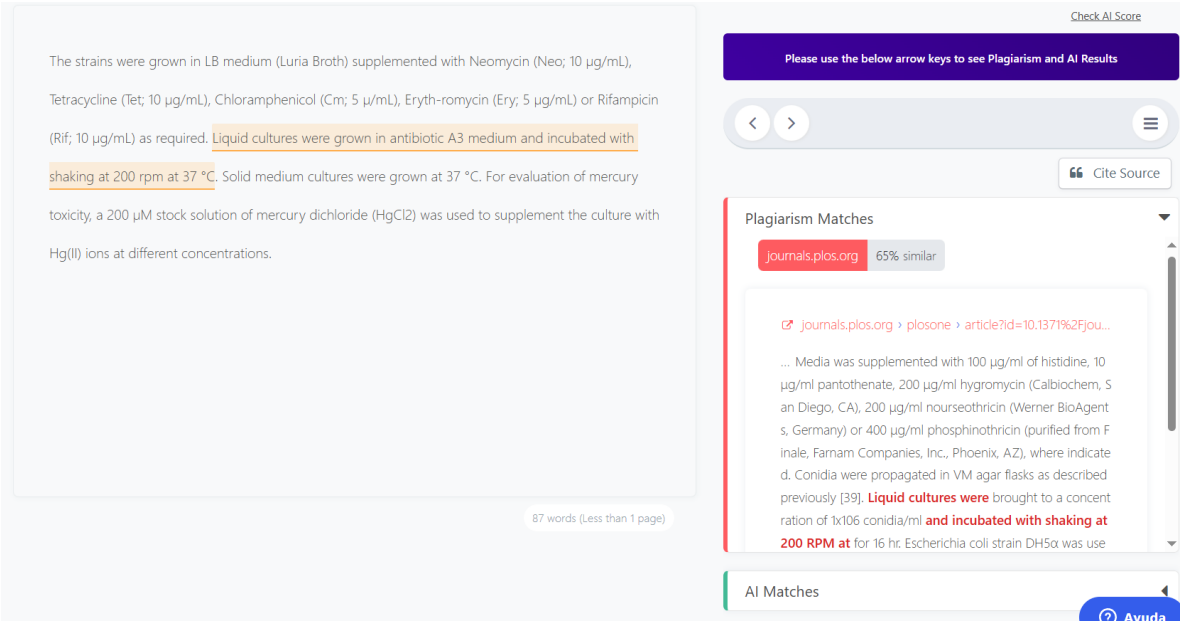


Report of <u>Last part of the Introduction</u> section

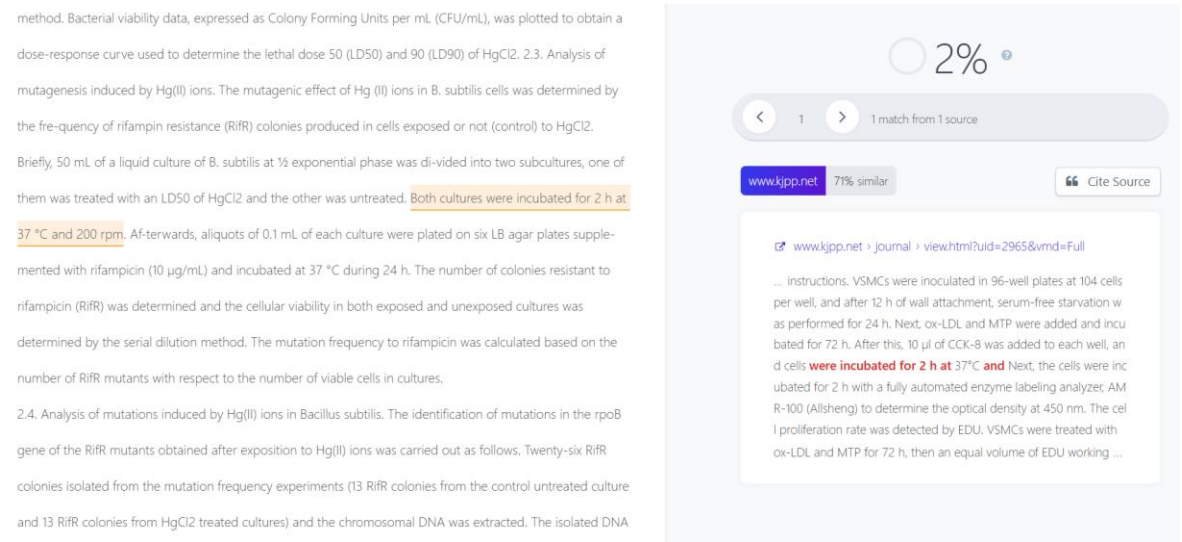


Report of <u>Materials and Methods 2.1 and 2.2 sections</u>

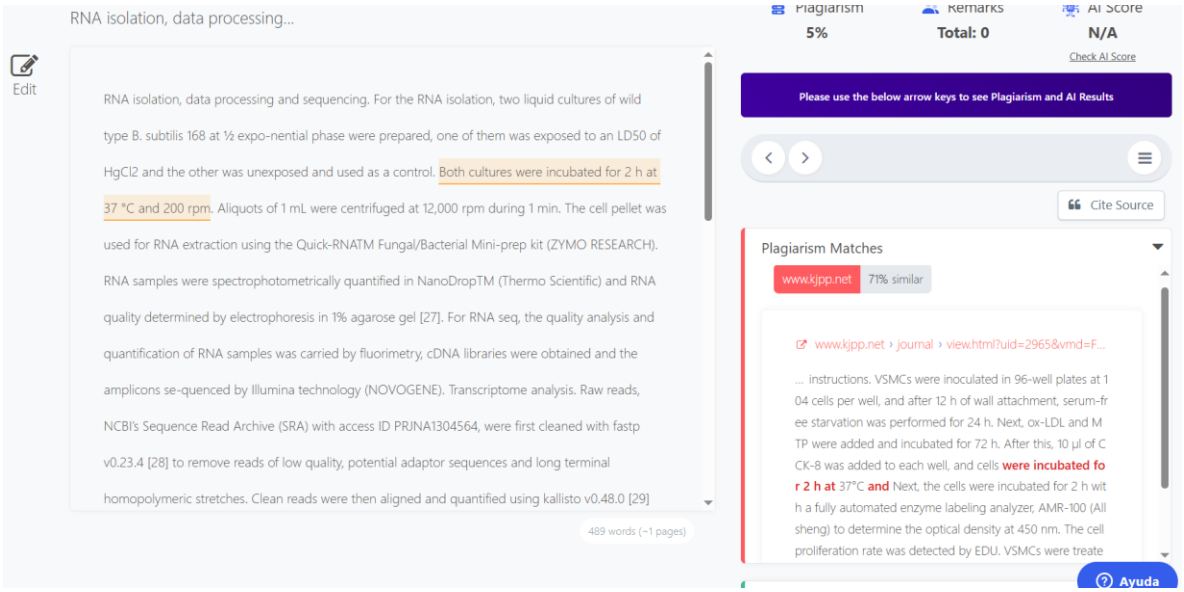
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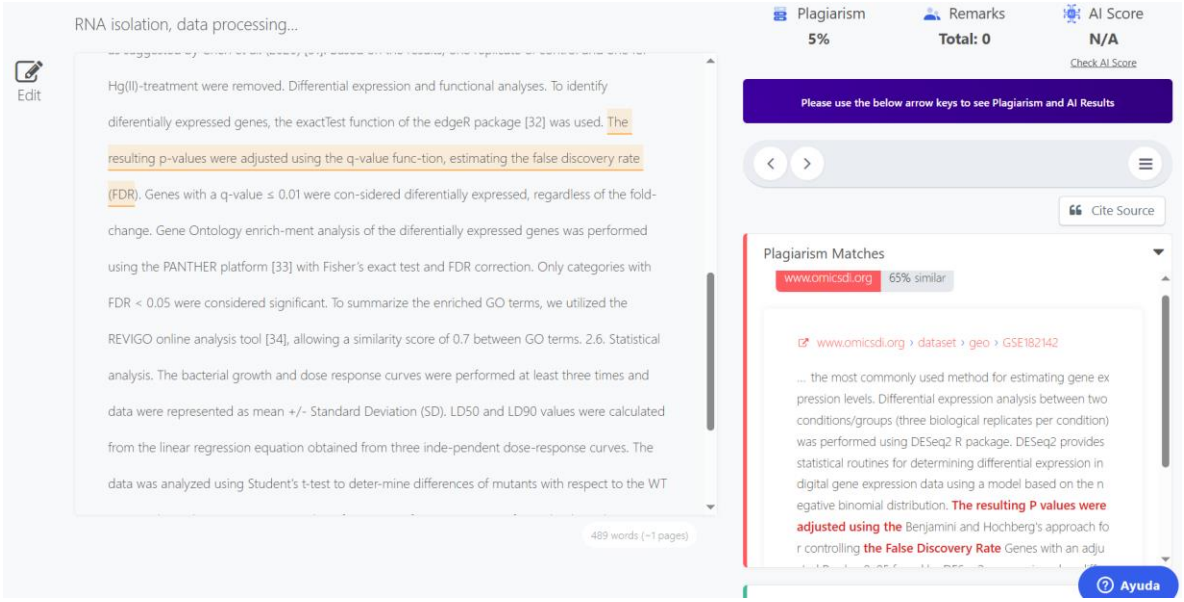
Report of Materials and Methods 2.3 and 2.4 sections



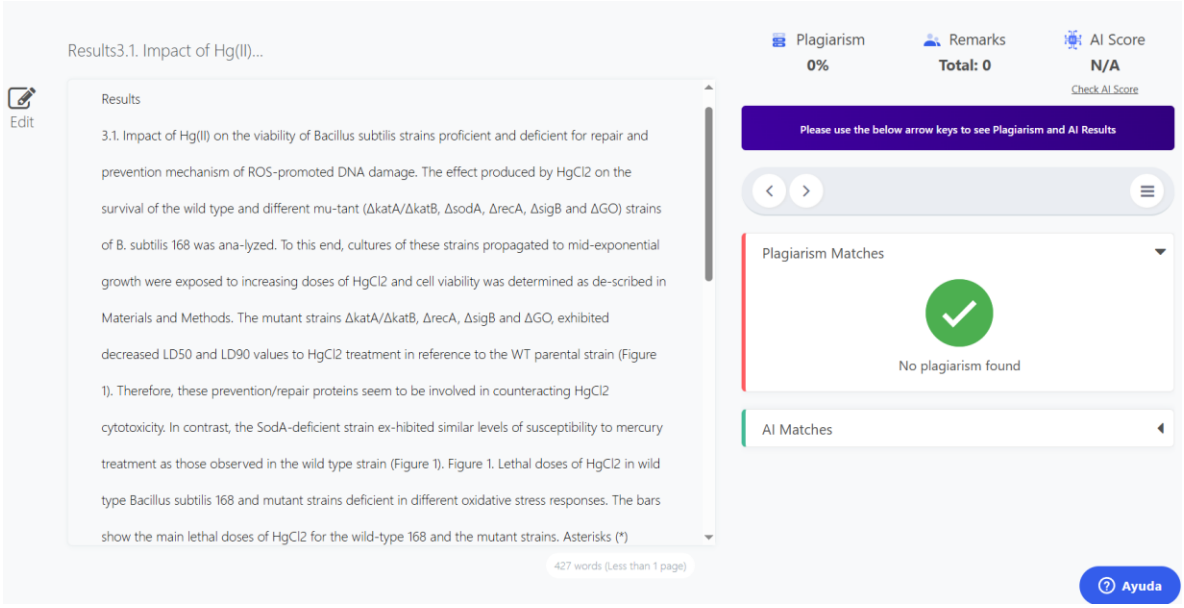
Report of Materials and Methods 2.5 section



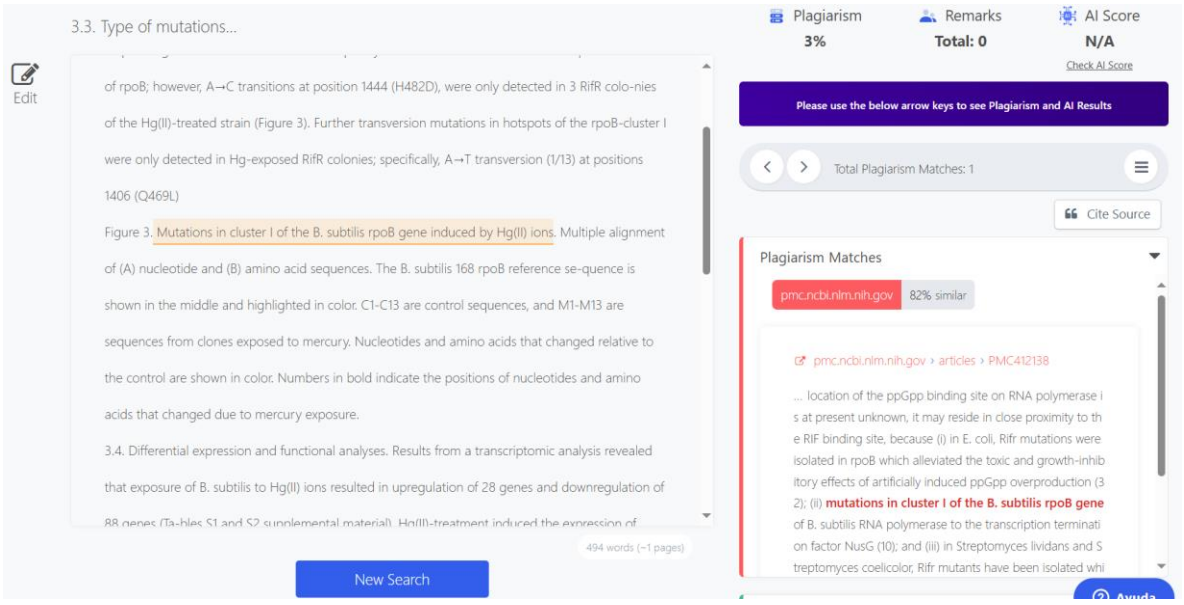
Report of Materials and Methods 2.5.3. section



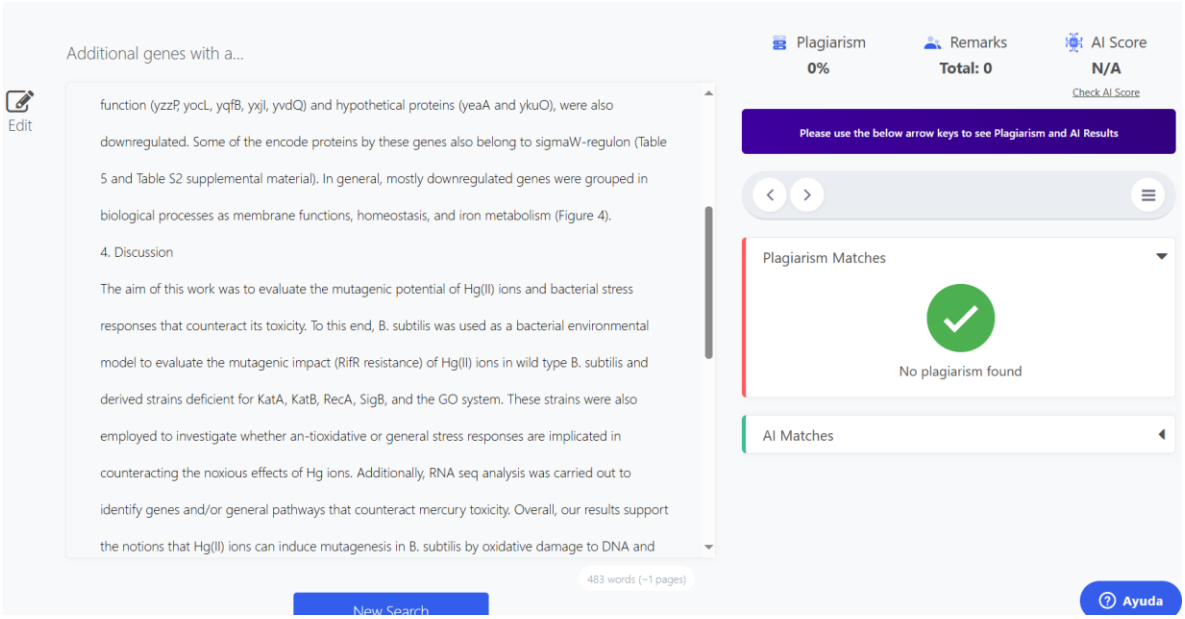
Report of First part of Results section



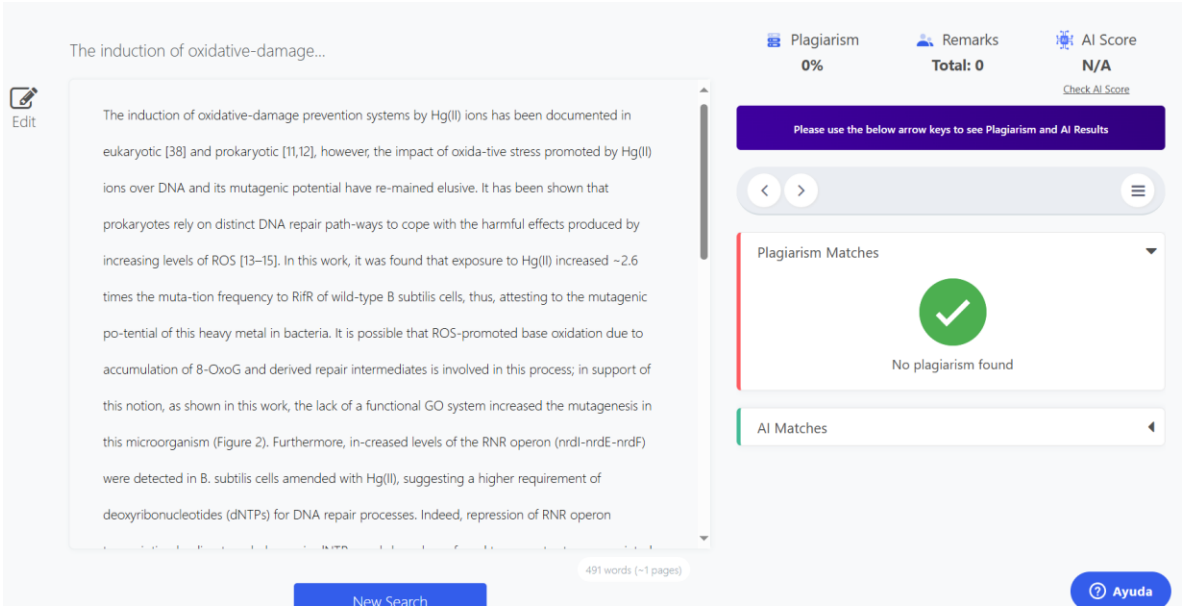
Report of <u>Second part of Results</u> section



Report of Third part of Results and First part of Discussion sections

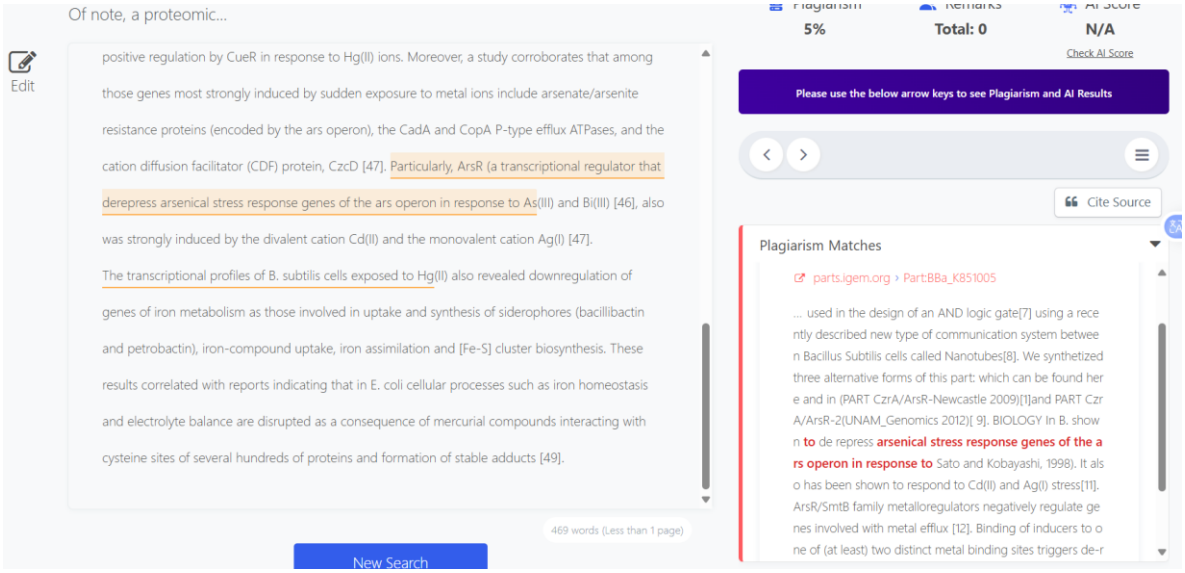


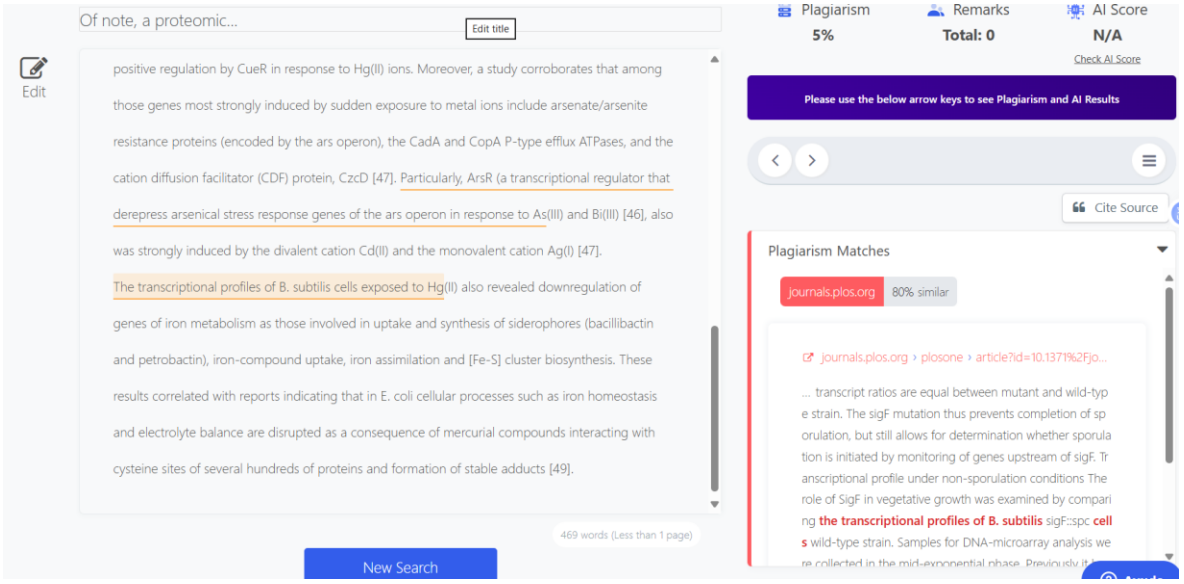
Report of the Second part of Discussion section



Report of the Third part of Discussion section

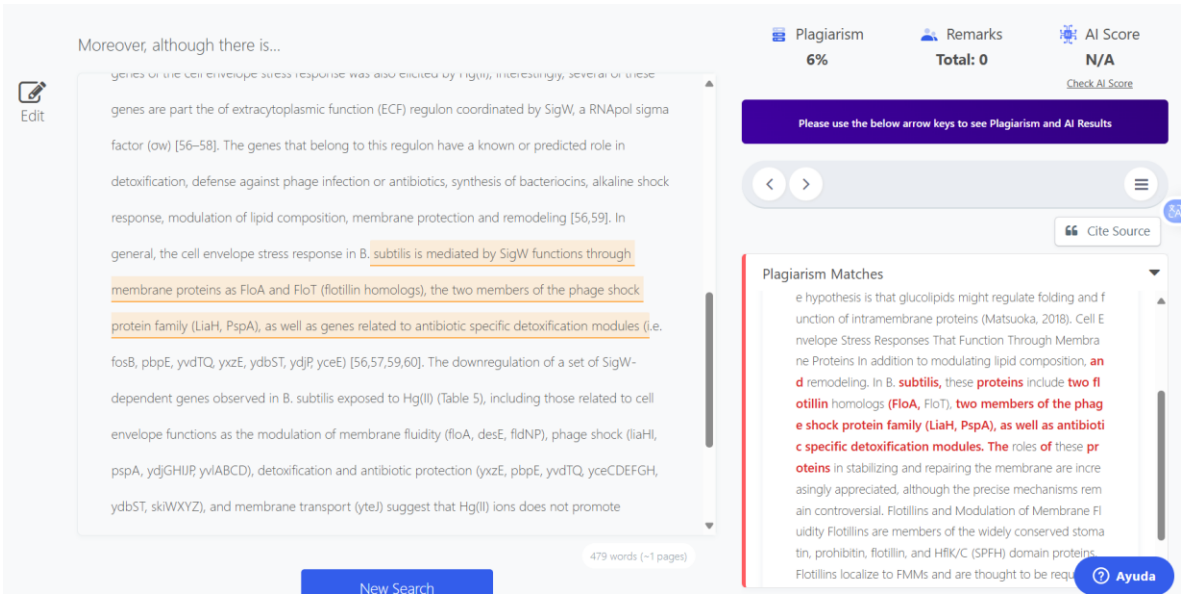
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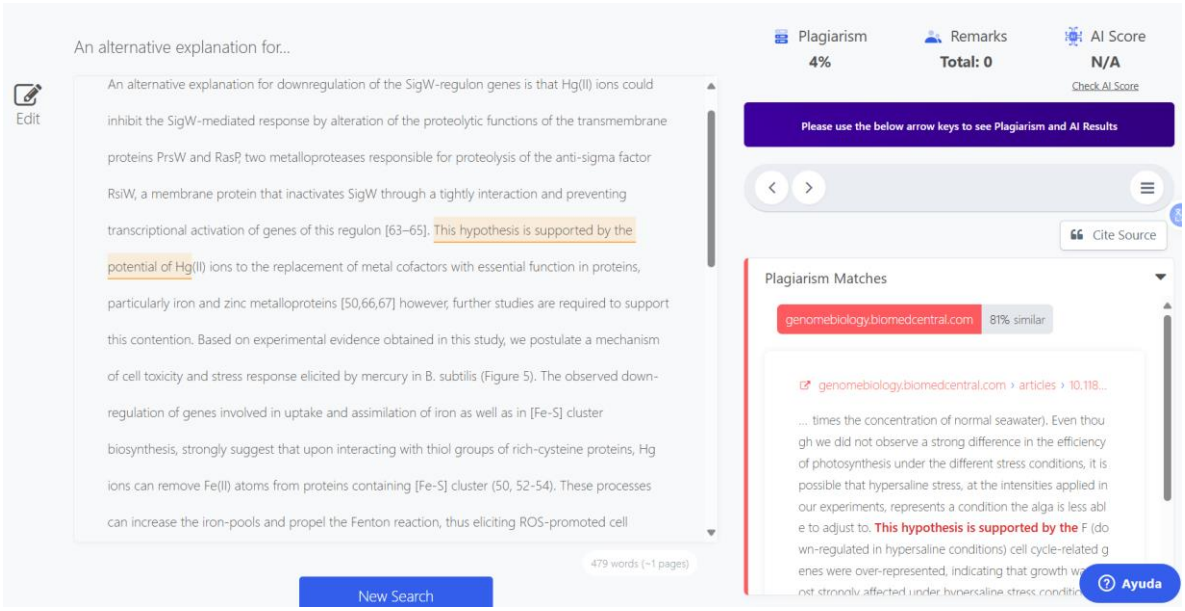
Report of the Fourth part of Discussion section

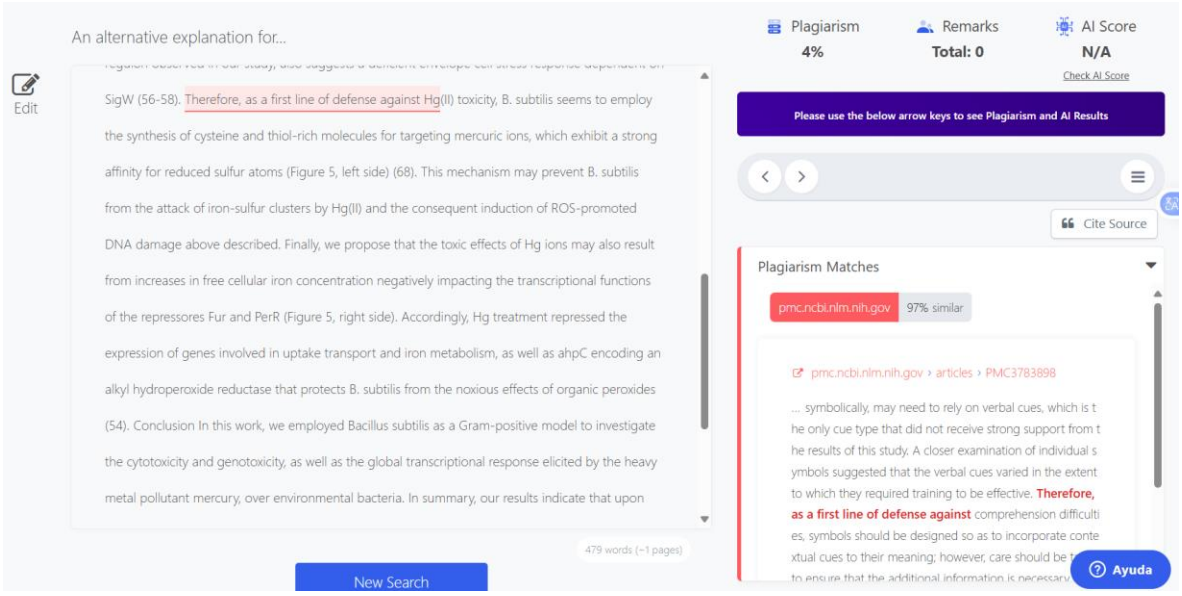
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Report of the <u>Fifth part of Discussion and Conclusion</u> sections

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An alternative explanation for...
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SigW (56-58). Therefore, as a first line of defense against Hg(II) toxicity, B. subtilis seems to employ the synthesis of cysteine and thiol-rich molecules for targeting mercuric ions, which exhibit a strong affinity for reduced sulfur atoms (Figure 5, left side) (68). This mechanism may prevent B. subtilis from the attack of iron-sulfur clusters by Hg(II) and the consequent induction of ROS-promoted DNA damage above described. Finally, we propose that the toxic effects of Hg ions may also result from increases in free cellular iron concentration negatively impacting the transcriptional functions of the repressores Fur and PerR (Figure 5, right side). Accordingly, Hg treatment repressed the expression of genes involved in uptake transport and iron metabolism, as well as ahpC encoding an alkyl hydroperoxide reductase that protects B. subtilis from the noxious effects of organic peroxides (54). Conclusion In this work, we employed Bacillus subtilis as a Gram-positive model to investigate the cytotoxicity and genotoxicity, as well as the global transcriptional response elicited by the heavy metal pollutant mercury, over environmental bacteria. In summary, our results indicate that upon
479 words (~1 pages)
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... symbolically, may need to rely on verbal cues, which is t he only cue type that did not receive strong support from t he results of this study. A closer examination of individual s ymbols suggested that the verbal cues varied in the extent to which they required training to be effective. Therefore, as a first line of defense against comprehension difficulti es, symbols should be designed so as to incorporate conte xtual cues to their meaning; however, care should be t
Ayuda